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On Some Combinatorial Properties of the Star Cayley Graph

N. Imani
&
H. Sarbazi-Azad
School of Computer Science, IPM
&
Sharif University of Technology
&
S.G. Akl
Queen's University
Ontario, Canada

The star cayley graph, as an interesting network topology for interconnection networks, has been extensively studied in the past. In this paper, we address some of the combinatorial properties of this graph. In particular, we consider the problem of calculating the surface area of the star graph, answering an open problem posed in 1995. Many of the properties and algorithms derived for the star graph become directly or indirectly dependant on knowing its surface area. Hence, solving this problem removes the obstacle in the way of proving the theorem and properties which are proposed for many other network topologies. The obtained equation would also help in estimating the computational complexity of the algorithms derived for the star graph.